

## **R E M A R K S**

This is responsive to the Final Office Action that was mailed June 7, 2006 (hereinafter "Office Action").

### **Claim Rejections Under 35 U.S.C. §103(a)**

Claims 1, 8, and 43-44 are rejected under 35 U.S.C. §103(a) as being unpatentable over Pittman et al. (U.S. 5,998,968)("Pittman") in view of Uribe et al. (US 6,635,369)("Uribe").

With respect to claim 1, and the claims which depend from claim 1, claim 1 discloses a fuel cell maintenance device that comprises a switch and a pulse generator capable of pulsing a cathode of at least one cell of a fuel cell stack through the switch when the switch is closed. As discussed below, Applicant maintains that all of these features are not taught or suggested by the disclosures of Pittman and Uribe, when considered individually or in combination with one another.

Pittman discloses a battery charger which employs a charging sequence. Col. 3, lines 53-55. Pittman fails to teach or suggest a fuel cell maintenance device that comprises a switch and a pulse generator capable of pulsing a cathode of at least one cell of a fuel cell stack through the switch when the switch is closed. Further, as the Office acknowledges, Pittman does not teach employing a charging sequence as a fuel cell maintenance device on a fuel cell stack. Office Action, pages 2 and 20.

Uribe is directed to a method of operating a fuel cell at high voltage for sustained periods of time. Col. 2, lines 39-40. The method of Uribe includes switching the cathode to an output load. Col. 2, line 41. Uribe only discloses single fuel cells. Col. 4, line 54 and Col. 5, line 4. Uribe fails to teach or suggest a fuel cell maintenance device that comprises a switch and a pulse generator capable of pulsing a cathode of at least one cell of a fuel cell stack through the switch when the switch is closed. Uribe fails to teach or suggest using the method of Uribe for a fuel cell stack having a plurality of fuel cells. Uribe fails to teach that the method of Uribe may be used on a fuel cell stack having a plurality

of fuel cells. Uribe contains no suggestion to extend the teaching of Uribe to fuel cell stacks having a plurality of fuel cells.

First, Applicant would point out that the Office acknowledges that neither Pittman nor Uribe teaches the use of their respective systems in a multi cell system. Office Action, page 4 ("Neither Pittman nor Uribe expressly teach of the system being used in a multi cell system"). Therefore, the references, Uribe and Pittman, do not teach all of the claim limitations as neither is directed to a multi cell system. As a result, claim 1, and the claims which depend from claim 1, is not unpatentable over Pittman in view of Uribe. Reconsideration and withdrawal of the rejection of claim 1 under §103(a) is respectfully requested.

Second, the Office suggests that it would have been obvious to a person of ordinary skill in the art at the time of the invention to use the system of Pittman with fuel cells, as Uribe teaches it would improve the performance of fuel cells. Office Action, page 2. The Office provides no explanation of the suggestion or motivation to combine Pittman and Uribe. *In re Fritch*, 972 F.2d 1260, 23 U.S.P.Q.2d 1780 (Fed. Cir. 1992). "Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching suggestion or incentive supporting the combination." *In re Geiger*, 815 F.2d 686, 2 U.S.P.Q. 2d 1276, 1278 (Fed. Cir. 1987). The Office has provided no showing of the teaching or motivation to combine Pittman and Uribe. Uribe contains no reference to employing a charging sequence. Uribe contains no teaching that a battery charger which employs a charging sequence, such as Pittman, would improve the performance of a fuel cell stack having a plurality of fuel cells. Uribe would not have motivated one skilled in the art to use the system of Pittman on a fuel cell stack having a plurality of fuel cells.

As a result, one skilled in the art would not have construed Uribe as teaching or suggesting using the system on Pittman on a fuel cell stack having a plurality of fuel cells. Therefore, claim 1 is not unpatentable over Pittman in view of Uribe. Reconsideration and withdrawal of the rejection of claim 1 under §103(a) is respectfully requested.

Claim 8, which depends from claim 1, also stands rejected under 35 U.S.C. § 103(a) over Pittman in view of Uribe. Claim 8 further recites that at

least one of the switch and the pulse generator is capable of receiving power from the fuel cell stack. As acknowledged by the Office, neither Pittman nor Uribe disclose systems configured to receive the power returned from a fuel cell stack. Office Action, page 5. Claim 8 is believed to be in condition for allowance for the foregoing reason and by virtue of its dependency from claim 1, discussed above. Applicant respectfully requests reconsideration and withdrawal of this rejection of claim 8.

With respect to claim 43, and the claims which depend from claim 43, claim 43 discloses a fuel cell maintenance device that comprises a means for imposing a low impedance across at least one cell of a fuel cell stack and a pulse generator capable of pulsing a cathode of the at least one cell of a fuel cell stack through the low impedance imposing means. As discussed below, Applicant maintains that all of these features are not taught or suggested by the disclosures of Pittman and Uribe, when considered individually or in combination with one another.

Pittman discloses a battery charger which employs a charging sequence. Col. 3, lines 53-55. Pittman fails to teach or suggest a fuel cell maintenance device that comprises a means for imposing a low impedance across at least one cell of a fuel cell stack and a pulse generator capable of pulsing a cathode of the at least one cell of a fuel cell stack through the low impedance imposing means. Further, as the Office acknowledges, Pittman does not teach employing a charging sequence as a fuel cell maintenance device on a fuel cell stack. Office Action, page 3.

Uribe is directed to a method of operating a fuel cell at high voltage for sustained periods of time. Col. 2, lines 39-40. The method of Uribe includes switching the cathode to an output load. Col. 2, line 41. Uribe only discloses single fuel cells. Col. 4, line 54 and Col. 5, line 4. Uribe fails to teach or suggest a fuel cell maintenance device that comprises a means for imposing a low impedance across at least one cell of a fuel cell stack and a pulse generator capable of pulsing a cathode of the at least one cell of a fuel cell stack through the low impedance imposing means. Uribe fails to teach or suggest using the method of Uribe for a fuel cell stack having a plurality of fuel cells. Uribe fails to

teach that the method of Uribe may be used on a fuel cell stack having a plurality of fuel cells. Uribe contains no suggestion to extend the teaching of Uribe to fuel cell stacks having a plurality of fuel cells.

First, Applicant would point out that the Office acknowledges that neither Pittman nor Uribe teaches the use of their respective systems in a multi cell system. Office Action, page 4 ("Neither Pittman nor Uribe expressly teach of the system being used in a multi cell system"). Therefore, the references, Uribe and Pittman, do not teach all of the claim limitations as neither is directed to a multi cell system. As a result, claim 43, and the claims which depend from claim 43, is not unpatentable over Pittman in view of Uribe. Reconsideration and withdrawal of the rejection of claim 43 under §103(a) is respectfully requested.

Second, the Office suggests that it would have been obvious to a person of ordinary skill in the art at the time of the invention to use the system of Pittman with fuel cells, as Uribe teaches it would improve the performance of fuel cells. Office Action, page 3. The Office provides no explanation of the suggestion or motivation to combine Pittman and Uribe. *In re Fritch*, 972 F.2d 1260, 23 U.S.P.Q.2d 1780 (Fed. Cir. 1992). "Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching suggestion or incentive supporting the combination." *In re Geiger*, 815 F.2d 686, 2 U.S.P.Q. 2d 1276, 1278 (Fed. Cir. 1987). The Office has provided no showing of the teaching or motivation to combine Pittman and Uribe. Uribe contains no reference to employing a charging sequence. Uribe contains no teaching that a battery charger which employs a charging sequence, such as Pittman, would improve the performance of a fuel cell stack having a plurality of fuel cells. Uribe would not have motivated one skilled in the art to use the system of Pittman on a fuel cell stack having a plurality of fuel cells.

As a result, one skilled in the art would not have construed Uribe as teaching or suggesting using the system on Pittman on a fuel cell stack having a plurality of fuel cells. Therefore, claim 43 is not unpatentable over Pittman in view of Uribe. Reconsideration and withdrawal of the rejection of claim 43 under §103(a) is respectfully requested.

Claim 44, which depends from claim 43, also stands rejected under 35 U.S.C. § 103(a) over Pittman in view of Uribe. Claim 44 further recites that the low impedance means includes a switch that imposes the low impedance when closed and receiving a pulse from the pulse generator. Claim 44 is believed to be in condition for allowance by virtue of its dependency from claim 43, discussed above. Applicant respectfully requests reconsideration and withdrawal of this rejection of claim 44.

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Claims 2-7, 9-42, and 44-54 are rejected under 35 U.S.C. §103(a) as being unpatentable over Pittman et al. ("Pittman") in view of Uribe et al. ("Uribe") in further view of lino et al. (US 6,313,637)("lino").

Claim 2, which depends from claim 1, stands rejected under 35 U.S.C. §103(a) over Pittman in view of Uribe and in further view of lino. Claim 2 further recites that the switch comprises a relay capable of shorting the cell of a fuel cell stack, and a dielectrically isolated driver capable of driving the relay. Claim 2 is believed to be in condition for allowance by virtue of its dependency from claim 1 and for those reasons that follow. As discussed below, Applicant maintains that none of the features of claim 2 are taught or suggested by the disclosures of Pittman, Uribe, and lino, when considered individually or in combination with one another.

As acknowledged by the Office, neither Pittman nor Uribe teach using a dielectrically isolated driver. Office Action, pages 4 and 21. In addition, as acknowledged by the Office, neither Pittman nor Uribe teaches the use of their respective systems in a multi cell system. Office Action, page 4. lino discloses a voltage detecting device for a set battery. Col. 3, lines 21-22. lino fails to teach or suggest a fuel cell maintenance device that comprises a switch and a pulse generator capable of pulsing a cathode of the at least one cell of a fuel cell stack through the switch when the switch is closed wherein the switch comprises a relay capable of shorting the cell of a fuel cell stack and a dielectrically isolated driver capable of driving the relay. Further, lino does not teach using dielectrically isolated drivers to control the operation of a fuel cell stack.

The Office suggests that it would have been obvious to a person of ordinary skill in the art at the time of the invention to combine the teachings of lino and use dielectrically isolated drivers. Office Action, page 4. Foremost, Applicant would point out that Uribe does not teach using the method of Uribe for a fuel cell stack having a plurality of fuel cells. Therefore, Uribe would not have motivated one skilled in the art to use the system of Pittman and the dielectrically isolated driver of lino on a fuel cell stack having a plurality of fuel cells. Further, the Office provides no explanation of the suggestion or motivation to combine Pittman, Uribe, and lino. *In re Fritch*, 972 F.2d 1260, 23 U.S.P.Q.2d 1780 (Fed. Cir. 1992). "Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching suggestion or incentive supporting the combination." *In re Geiger*, 815 F.2d 686, 2 U.S.P.Q.2d 1276, 1278 (Fed. Cir. 1987). The Office has provided no showing of the teaching or motivation to combine Pittman, Uribe, and lino.

As a result, one skilled in the art would not have construed Uribe as teaching or suggesting using the system on Pittman and the dielectrically isolated driver of lino on a fuel cell stack having a plurality of fuel cells. Therefore, claim 2 is not unpatentable over Pittman in view of Uribe and further in view of lino. Reconsideration and withdrawal of the rejection of claim 2 under §103(a) is respectfully requested.

Claim 3, which depends from claim 2, also stands rejected under 35 U.S.C. § 103(a) over Pittman in view of Uribe and in further view of lino. Claim 3 further recites that the relay comprises a solid-state relay. Claim 3 is believed to be in condition for allowance by virtue of its dependency from claim 2, discussed above. Applicant respectfully requests reconsideration and withdrawal of this rejection of claim 3.

Claim 4, which also depends from claim 2, also stands rejected under 35 U.S.C. § 103(a) over Pittman in view of Uribe and in further view of lino. Claim 4 further recites that the relay is further capable of shorting a second cell of the fuel cell stack. Claim 4 is believed to be in condition for allowance by virtue of its

dependency from claim 2, discussed above. Applicant respectfully requests reconsideration and withdrawal of this rejection of claim 4.

Claim 5, which depends from claim 1, stands rejected under 35 U.S.C. §103(a) over Pittman in view of Uribe and in further view of lino. Claim 5 recites that the fuel cell maintenance device of claim 1 further comprises a second switch through which the pulse generator is capable of pulsing a cathode of a second cell when the second switch is closed; and a control circuit capable of controlling to which of the first and second relays the pulse generator output is transmitted. Claim 5 is believed to be in condition for allowance by virtue of its dependency from claim 1 and for those reasons that follow. As discussed below, Applicant maintains that none of the features of claim 5 are taught or suggested by the disclosures of Pittman, Uribe, and lino, when considered individually or in combination with one another.

As acknowledged by the Office, neither Pittman nor Uribe teach use the systems of Pittman or Uribe respectively on a multi cell system or specifically, a multi fuel cell, fuel cell stack. Office Action, page 4. lino discloses a voltage detecting device for a set battery. Col. 3, lines 21-22. lino fails to teach or suggest a fuel cell maintenance device of that comprises a switch, a pulse generator capable of pulsing a cathode of the at least one cell of a fuel cell stack through the switch when the switch is closed, a second switch through which the pulse generator is capable of pulsing a cathode of a second cell when the second switch is closed, and a control circuit capable of controlling to which of the first and second relays the pulse generator output is transmitted. Further, lino does not teach use of the system of lino on a fuel cell stack.

The Office suggests that it would have been obvious to a person of ordinary skill in the art at the time of the invention to duplicate the parts of Pittman and use the system for maintenance with lino's stack of cells. Office Action, pages 4-5. Foremost, Applicant would point out that neither Pittman nor lino teach or suggest the use of their respective systems on a fuel cell stack. Therefore, lino would not have motivated one skilled in the art to combine or modify Pittman and lino and apply the system to a fuel cell stack. Further, the Office provides no explanation of the suggestion or motivation to combine

Pittman, Uribe, and Iino. *In re Fritch*, 972 F.2d 1260, 23 U.S.P.Q.2d 1780 (Fed. Cir. 1992). "Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching suggestion or incentive supporting the combination." *In re Geiger*, 815 F.2d 686, 2 U.S.P.Q.2d 1276, 1278 (Fed. Cir. 1987). The Office has provided no showing of the teaching or motivation to combine Pittman, Uribe, and Iino. Therefore, claim 5 is not unpatentable over Pittman in view of Uribe and further in view of Iino. Reconsideration and withdrawal of the rejection of claim 5 under §103(a) is respectfully requested.

Claim 6, which depends from claim 5, also stands rejected under 35 U.S.C. § 103(a) over Pittman in view of Uribe and in further view of Iino. Claim 6 further recites that the second switch includes a second relay capable of shorting at least a second cell of a fuel cell stack; and a second dielectrically isolated driver capable of driving a second relay responsive to the pulse generator output. Claim 6 is believed to be in condition for allowance by virtue of its dependency from claim 5, discussed above. Applicant respectfully requests reconsideration and withdrawal of this rejection of claim 6.

Claim 7, which depends from claim 6, also stands rejected under 35 U.S.C. § 103(a) over Pittman in view of Uribe and in further view of Iino. Claim 7 further recites that at least one of the first relay and the second relay is further capable of shorting one of a third cell and a fourth cell of a fuel cell stack. Claim 7 is believed to be in condition for allowance by virtue of its dependency from claim 6, discussed above. Applicant respectfully requests reconsideration and withdrawal of this rejection of claim 7.

Claim 9, which depends from claim 8, stands rejected under 35 U.S.C. §103(a) over Pittman in view of Uribe and in further view of Iino. Claim 9 further recites a voltage regulator coupled to at least one of the switch and the pulse generator and configured to receive the power returned from the fuel cell stack. Claim 9 is believed to be in condition for allowance by virtue of its dependency from claim 8 and for those reasons that follow. As discussed below, Applicant



maintains that none of the features of claim 9 are taught or suggested by the disclosures of Pittman, Uribe, and lino, when considered individually or in combination with one another.

As acknowledged by the Office, neither Pittman nor Uribe teach configuring a system to receive power returned from a fuel cell stack. Office Action, page 5. In addition, as acknowledged by the Office, neither Pittman nor Uribe teaches the use of their respective systems in a multi cell system. Office Action, page 4. lino discloses a voltage detecting device for a set battery. Col. 3, lines 21-22. lino fails to teach or suggest a fuel cell maintenance device that comprises a switch and a pulse generator capable of pulsing a cathode of the at least one cell of a fuel cell stack through the switch when the switch is closed, wherein at least one of the switch and the pulse generator is capable of receiving power returned to the fuel cell stack, further comprising a voltage regulator coupled to at least one of the switch and the pulse generator and configured to receive the power returned from the fuel cell stack. Further, lino does not teach using dielectrically isolated drivers to control the operation of a fuel cell stack.

The Office states that it would have been obvious to a person of ordinary skill in the art at the time of the invention to use power that is being released by the battery during the pulsing for the system, and not let it just be wasted. Office Action, page 5-6. A mere reference to common sense is insufficient to supply the motivation or suggestion to combine Pittman, Uribe, and lino. *In re Lee*, 277 F.3d 1338, 61 U.S.P.Q.2d 1673, 1681 (Fed. Cir. 1988). The Office provides no suggestion or motivation to combine Pittman, Uribe, and lino. *In re Fritch*, 972 F.2d 1260, 23 U.S.P.Q.2d 1780 (Fed. Cir. 1992). "Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching suggestion or incentive supporting the combination." *In re Geiger*, 815 F.2d 686, 2 U.S.P.Q. 2d 1276, 1278 (Fed. Cir. 1987). The Office has provided no showing of the teaching or motivation to combine Pittman, Uribe, and lino. As a result, claim 9 is not unpatentable over Pittman in view of Uribe and further in view of lino. Reconsideration and withdrawal of the rejection of claim 9 under §103(a) is respectfully requested.

Claim 10, which depends from claim 1, stands rejected under 35 U.S.C. §103(a) over Pittman in view of Uribe and in further view of lino. Claim 10 further recites that the pulse generator is capable of pulsing a second cathode of a second cell when the switch is closed. Claim 10 is believed to be in condition for allowance by virtue of its dependency from claim 1 and for those reasons that follow. As discussed below, Applicant maintains that none of the features of claim 10 are taught or suggested by the disclosures of Pittman, Uribe, and lino, when considered individually or in combination with one another.

As acknowledged by the Office, neither Pittman nor Uribe teaches the use of their respective systems in a multi cell system. Office Action, page 6. lino discloses a voltage detecting device for a set battery. Col. 3, lines 21-22. lino fails to teach or suggest a fuel cell maintenance device that comprises a switch and a pulse generator capable of pulsing a cathode of the at least one cell of a fuel cell stack through the switch when the switch is closed, wherein the pulse generator is capable of pulsing a cathode of a second cell when the switch is closed. Further, lino does not teach of a detecting and controlling system for a multi cell fuel cell stack.

The Office states that it would have been obvious to a person of ordinary skill in the art at the time of the invention to duplicate the parts of Pittman and use the system for maintenance with lino's stack of cells. Office Action, page 6. The Office provides no suggestion or motivation to combine Pittman, Uribe, and lino. *In re Fritch*, 972 F.2d 1260, 23 U.S.P.Q.2d 1780 (Fed. Cir. 1992). "Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching suggestion or incentive supporting the combination." *In re Geiger*, 815 F.2d 686, 2 U.S.P.Q. 2d 1276, 1278 (Fed. Cir. 1987). The Office has provided no showing of the teaching or motivation to combine Pittman, Uribe, and lino. As a result, claim 10 is not unpatentable over Pittman in view of Uribe and further in view of lino. Reconsideration and withdrawal of the rejection of claim 9 under §103(a) is respectfully requested.

With respect to claim 11, and the claims which depend from claim 11, claim 11 discloses a fuel cell maintenance device that comprises at least one

relay capable of shorting at least one cell of a fuel cell stack; a dielectrically isolated driver capable of driving the relay; and a pulse generator capable of pulsing a cathode of the cell through the relay when the dielectrically isolated driver closes the relay to short the cell. As discussed below, Applicant maintains that all of these features are not taught or suggested by the disclosures of Pittman, Uribe, and Iino, when considered individually or in combination with one another.

Pittman discloses a battery charger which employs a charging sequence. Col. 3, lines 53-55. Pittman fails to teach or suggest a fuel cell maintenance device that comprises at least one relay capable of shorting at least one cell of a fuel cell stack; a dielectrically isolated driver capable of driving the relay; and a pulse generator capable of pulsing a cathode of the cell through the relay when the dielectrically isolated driver closes the relay to short the cell. Further, as the Office acknowledges, Pittman does not teach employing a charging sequence as a fuel cell maintenance device on a fuel cell stack. Office Action, page 6. Further, as the Office acknowledges, Pittman does not teach a dielectrically isolated driver. Office Action, page 6.

Iino discloses a voltage detecting device for a set battery. Col. 3, lines 21-22. Iino fails to teach or suggest a fuel cell maintenance device that comprises at least one relay capable of shorting at least one cell of a fuel cell stack; a dielectrically isolated driver capable of driving the relay; and a pulse generator capable of pulsing a cathode of the cell through the relay when the dielectrically isolated driver closes the relay to short the cell. Further, Iino does not teach using a dielectrically isolated driver in a fuel cell maintenance device for a fuel cell stack.

Uribe is directed to a method of operating a fuel cell at high voltage for sustained periods of time. Col. 2, lines 39-40. The method of Uribe includes switching the cathode to an output load. Col. 2, line 41. Uribe only discloses single fuel cells. Col. 4, line 54 and Col. 5, line 4. Uribe fails to teach or suggest a fuel cell maintenance device that comprises at least one relay capable of shorting at least one cell of a fuel cell stack; a dielectrically isolated driver capable of driving the relay; and a pulse generator capable of pulsing a cathode of the cell through the relay when the dielectrically isolated driver closes the relay

to short the cell. Uribe fails to teach or suggest using the method of Uribe for a fuel cell stack having a plurality of fuel cells. Uribe fails to teach that the method of Uribe may be used on a fuel cell stack having a plurality of fuel cells. Uribe contains no suggestion to extend the teaching of Uribe to fuel cell stacks having a plurality of fuel cells.

The Office suggests that it would have been obvious to a person of ordinary skill in the art at the time of the invention to use the system of Pittman with fuel cells, as Uribe teaches it would improve the performance of fuel cells. Office Action, pages 6-7. Foremost, Applicant would point out that the Office acknowledges that neither Pittman nor Uribe teaches the use of their respective systems in a multi cell system. Office Action, page 4. Further, Uribe does not teach using the method of Uribe for a fuel cell stack having a plurality of fuel cells. In addition, neither Pittman nor lino teach using their system with fuel cells. Therefore, Uribe would not have motivated one skilled in the art to use the system of Pittman on a fuel cell stack having a plurality of fuel cells. Further, the Office provides no explanation of the suggestion or motivation to combine Pittman, lino, and Uribe. *In re Fritch*, 972 F.2d 1260, 23 U.S.P.Q.2d 1780 (Fed. Cir. 1992). "Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching suggestion or incentive supporting the combination." *In re Geiger*, 815 F.2d 686, 2 U.S.P.Q. 2d 1276, 1278 (Fed. Cir. 1987). The Office has provided no showing of the teaching or motivation to combine Pittman, Uribe, and lino. Therefore, claim 11 is not unpatentable over Pittman in view of Uribe and in further view of lino. Reconsideration and withdrawal of the rejection of claim 11 under §103(a) is respectfully requested.

Claim 12, which depends from claim 11, also stands rejected under 35 U.S.C. § 103(a) over Pittman in view of Uribe and in further view of lino. Claim 12 further recites that the relay comprises a solid state relay. Claim 12 is believed to be in condition for allowance by virtue of its dependency from claim 11, discussed above. Applicant respectfully requests reconsideration and withdrawal of this rejection of claim 12.

Claim 13, which depends from claim 11, also stands rejected under 35 U.S.C. § 103(a) over Pittman in view of Uribe and in further view of lino. Claim 13 further recites that the relay is further capable of shorting a second cell of the fuel cell stack. Claim 13 is believed to be in condition for allowance by virtue of its dependency from claim 11, discussed above. Applicant respectfully requests reconsideration and withdrawal of this rejection of claim 13.

Claim 14, which depends from claim 11, also stands rejected under 35 U.S.C. § 103(a) over Pittman in view of Uribe and in further view of lino. Claim 14 further comprises a second relay capable of shorting at least a second cell of a fuel cell stack; a second dielectrically isolated driver capable of driving second relay responsive to the pulse generator output; and a control circuit capable of controlling to which of the first and second relays the pulse generator output is transmitted. Claim 14 is believed to be in condition for allowance by virtue of its dependency from claim 11, discussed above. Applicant respectfully requests reconsideration and withdrawal of this rejection of claim 14.

Claim 15, which depends from claim 14, also stands rejected under 35 U.S.C. § 103(a) over Pittman in view of Uribe and in further view of lino. Claim 15 further recites that at least one of the first relay and the second relay is further capable of shorting one of a third cell and a fourth cell of the fuel cell stack. Claim 15 is believed to be in condition for allowance by virtue of its dependency from claim 14, discussed above. Applicant respectfully requests reconsideration and withdrawal of this rejection of claim 15.

Claim 16, which depends from claim 11, also stands rejected under 35 U.S.C. § 103(a) over Pittman in view of Uribe and in further view of lino. Claim 16 further recites that at least one of the relay, the dielectrically isolated driver and the pulse generator is capable of receiving power returned from the fuel cell stack. Claim 16 is believed to be in condition for allowance by virtue of its dependency from claim 11 and for those reasons that follow. Applicant maintains, and the Office acknowledges, that none of the features of claim 16 are taught or suggested by the disclosures of Pittman, Uribe, and lino, when

considered individually or in combination with one another. Office Action, page 8. However, the Office states that it would have been obvious to a person of ordinary skill in the art at the time of the invention to use power that is being released by the battery during the pulsing for the system, and not let it just be wasted. Office Action, page 8. The Examiner states that the above statement is not a reference to common sense as a motivation. Office Action, page 21. The Office provides no suggestion or motivation to combine Pittman, Uribe, and Iino. *In re Fritch*, 972 F.2d 1260, 23 U.S.P.Q.2d 1780 (Fed. Cir. 1992). "Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching suggestion or incentive supporting the combination." *In re Geiger*, 815 F.2d 686, 2 U.S.P.Q. 2d 1276, 1278 (Fed. Cir. 1987). The Office has provided no showing of the teaching or motivation to combine Pittman, Uribe, and Iino. As a result, claim 16 is not unpatentable over Pittman in view of Uribe and further in view of Iino. Reconsideration and withdrawal of the rejection of claim 16 under §103(a) is respectfully requested.

Claim 17, which depends from claim 16, also stands rejected under 35 U.S.C. § 103(a) over Pittman in view of Uribe and in further view of Iino. Claim 17 further comprises a voltage regulator through which at least one of the relay, the dielectrically isolated driver and the pulse generator is capable of receiving power returned from the fuel cell stack. Claim 17 is believed to be in condition for allowance by virtue of its dependency from claim 16, discussed above. Applicant respectfully requests reconsideration and withdrawal of this rejection of claim 17.

Claim 18, which depends from claim 11, also stands rejected under 35 U.S.C. § 103(a) over Pittman in view of Uribe and in further view of Iino. Claim 18 further recites that the pulse generator is capable of pulsing a cathode of a second cell through the relay when the dielectrically isolated driver closes the relay to short the cell. Claim 18 is believed to be in condition for allowance by virtue of its dependency from claim 11, discussed above. Applicant respectfully requests reconsideration and withdrawal of this rejection of claim 18.

With respect to claim 19, and the claims which depend from claim 19, claim 19 discloses a fuel cell maintenance device for a fuel cell stack including at least one fuel cell comprising at least one relay electrically connected in parallel across the cell; a dielectrically isolated driver operably associated with the relay to drive the relay; and a pulse generator electrically connected to the dielectrically isolated driver to pulse a cathode of the cell through the relay when the dielectrically isolated driver closes the relay. As discussed below, Applicant maintains that all of these features are not taught or suggested by the disclosures of Pittman, Uribe, and Iino, when considered individually or in combination with one another.

Pittman discloses a battery charger which employs a charging sequence. Col. 3, lines 53-55. Pittman fails to teach or suggest fuel cell maintenance device for a fuel cell stack including at least one fuel cell comprising at least one relay electrically connected in parallel across the cell; a dielectrically isolated driver operably associated with the relay to drive the relay; and a pulse generator electrically connected to the dielectrically isolated driver to pulse a cathode of the cell through the relay when the dielectrically isolated driver closes the relay. Further, as the Office acknowledges, Pittman does not teach employing a charging sequence as a fuel cell maintenance device on a fuel cell stack. Office Action, page 9. Further, as the Office acknowledges, Pittman does not teach a dielectrically isolated driver. Office Action, page 9.

Iino discloses a voltage detecting device for a set battery. Col. 3, lines 21-22. Iino fails to teach or suggest fuel cell maintenance device for a fuel cell stack including at least one fuel cell comprising at least one relay electrically connected in parallel across the cell; a dielectrically isolated driver operably associated with the relay to drive the relay; and a pulse generator electrically connected to the dielectrically isolated driver to pulse a cathode of the cell through the relay when the dielectrically isolated driver closes the relay. Further, Iino does not teach using a dielectrically isolated driver in a fuel cell maintenance device for a fuel cell stack.

The Office suggests that it would have been obvious to a person of ordinary skill in the art at the time of the invention to combine the teaching of Iino and use a dielectrically isolated device to control the system of Pittman. Office

Action, pages 9. The Office provides no explanation of the suggestion or motivation to combine Pittman and lino. *In re Fritch*, 972 F.2d 1260, 23 U.S.P.Q.2d 1780 (Fed. Cir. 1992). "Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching suggestion or incentive supporting the combination." *In re Geiger*, 815 F.2d 686, 2 U.S.P.Q. 2d 1276, 1278 (Fed. Cir. 1987). The Office has provided no showing of the teaching or motivation to combine Pittman and lino. As a result, one skilled in the art would not have combined Pittman and lino.

Further, Uribe is directed to a method of operating a fuel cell at high voltage for sustained periods of time. Col. 2, lines 39-40. The method of Uribe includes switching the cathode to an output load. Col. 2, line 41. Uribe only discloses single fuel cells. Col. 4, line 54 and Col. 5, line 4. Uribe fails to teach or suggest fuel cell maintenance device for a fuel cell stack including at least one fuel cell comprising at least one relay electrically connected in parallel across the cell; a dielectrically isolated driver operably associated with the relay to drive the relay; and a pulse generator electrically connected to the dielectrically isolated driver to pulse a cathode of the cell through the relay when the dielectrically isolated driver closes the relay. Uribe fails to teach or suggest using the method of Uribe for a fuel cell stack having a plurality of fuel cells. Uribe fails to teach that the method of Uribe may be used on a fuel cell stack having a plurality of fuel cells. Uribe contains no suggestion to extend the teaching of Uribe to fuel cell stacks having a plurality of fuel cells.

The Office suggests that it would have been obvious to a person of ordinary skill in the art at the time of the invention to use the system of Pittman with fuel cells. Office Action, page 9. Foremost, Applicant would point out that the Office acknowledges that neither Pittman nor Uribe teaches the use of their respective systems in a multi cell system. Office Action, page 4. Further, Uribe does not teach using the method of Uribe for a fuel cell stack having a plurality of fuel cells. Therefore, Uribe would not have motivated one skilled in the art to use the system of Pittman on a fuel cell stack having a plurality of fuel cells. Further, the Office provides no explanation of the suggestion or motivation to combine Pittman and Uribe. *In re Fritch*, 972 F.2d 1260, 23 U.S.P.Q.2d 1780 (Fed. Cir.



1992). "Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching suggestion or incentive supporting the combination." *In re Geiger*, 815 F.2d 686, 2 U.S.P.Q. 2d 1276, 1278 (Fed. Cir. 1987). The Office has provided no showing of the teaching or motivation to combine Pittman and Uribe. As a result, one skilled in the art would not have construed Uribe as teaching or suggesting using the system of Pittman on a fuel cell stack having a plurality of fuel cells.

Therefore, claim 19 is not unpatentable over Pittman in view of Uribe and in further view of lino. Reconsideration and withdrawal of the rejection of claim 19 under §103(a) is respectfully requested.

Claim 20, which depends from claim 19, also stands rejected under 35 U.S.C. § 103(a) over Pittman in view of Uribe and in further view of lino. Claim 20 further recites that the relay comprises a solid-state relay. Claim 20 is believed to be in condition for allowance by virtue of its dependency from claim 19, discussed above. Applicant respectfully requests reconsideration and withdrawal of this rejection of claim 20.

Claim 21, which depends from claim 19, also stands rejected under 35 U.S.C. § 103(a) over Pittman in view of Uribe and in further view of lino. Claim 21 further recites that the relay is further electrically connected in parallel across a second cell of the fuel cell stack. Claim 21 is believed to be in condition for allowance by virtue of its dependency from claim 19, discussed above. Applicant respectfully requests reconsideration and withdrawal of this rejection of claim 21.

Claim 22, which depends from claim 19, also stands rejected under 35 U.S.C. § 103(a) over Pittman in view of Uribe and in further view of lino. Claim 22 further comprises a second relay electrically connected in parallel across a second cell of a fuel cell stack; a second dielectrically isolated driver capable of driving second relay responsive to the pulse generator output; and a control circuit capable of controlling to which of the first and second relays the pulse generator output is transmitted. Claim 22 is believed to be in condition for

allowance by virtue of its dependency from claim 19, discussed above. Applicant respectfully requests reconsideration and withdrawal of this rejection of claim 22.

Claim 23, which depends from claim 22, also stands rejected under 35 U.S.C. § 103(a) over Pittman in view of Uribe and in further view of lino. Claim 23 further recites that at least one of the first relay and the second relay is further electrically connected in parallel across one of a third cell and a fourth cell of the fuel cell stack. Claim 23 is believed to be in condition for allowance by virtue of its dependency from claim 22, discussed above. Applicant respectfully requests reconsideration and withdrawal of this rejection of claim 23.

Claim 24, which depends from claim 19, also stands rejected under 35 U.S.C. § 103(a) over Pittman in view of Uribe and in further view of lino. Claim 24 further comprises a power return from the fuel cell stack to at least one of the pulse generator, the relay and dielectrically isolated driver. Claim 24 is believed to be in condition for allowance by virtue of its dependency from claim 19 and for those reasons that follow. The Office acknowledges that neither Pittman, Uribe, nor lino teach where the power returned is received. However, the Office states that it would have been obvious to a person of ordinary skill in the art at the time of the invention to use power that is being released by the battery during the pulsing for the system, and not let it just be wasted. Office Action, pages 10-11. The Examiner states that the above statement is not a reference to common sense as a motivation. Office Action, page 21. The Office provides no suggestion or motivation to combine Pittman, Uribe, and lino. *In re Fritch*, 972 F.2d 1260, 23 U.S.P.Q.2d 1780 (Fed. Cir. 1992). "Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching suggestion or incentive supporting the combination." *In re Geiger*, 815 F.2d 686, 2 U.S.P.Q. 2d 1276, 1278 (Fed. Cir. 1987). The Office has provided no showing of the teaching or motivation to combine Pittman, Uribe, and lino. As a result, claim 24 is not unpatentable over Pittman in view of Uribe and further in view of lino. Reconsideration and withdrawal of the rejection of claim 24 under §103(a) is respectfully requested.

Claim 25, which depends from claim 24, also stands rejected under 35 U.S.C. § 103(a) over Pittman in view of Uribe and in further view of Iino. Claim 25 further recites that the power return includes a voltage regulator. Claim 25 is believed to be in condition for allowance by virtue of its dependency from claim 24, discussed above. Applicant respectfully requests reconsideration and withdrawal of this rejection of claim 25.

Claim 26, which depends from claim 19, also stands rejected under 35 U.S.C. § 103(a) over Pittman in view of Uribe and in further view of Iino. Claim 26 further recites that the relay is electrically connected in parallel across a second cell and the pulse generator is electrically connected to the dielectrically isolated driver to pulse a cathode of the second cell through the relay when the dielectrically isolated driver closes the relay. Claim 26 is believed to be in condition for allowance by virtue of its dependency from claim 19, discussed above. Applicant respectfully requests reconsideration and withdrawal of this rejection of claim 26.

With respect to claim 27, and the claims which depend from claim 27, claim 27 discloses an apparatus that comprises a fuel stack, including a plurality of cells; a switch bank, including a plurality of switches, each switch electrically connected in parallel across at least one of the cells; a pulse generator capable of pulsing the cathodes of the cells when the respective switch is closed; and a control circuit electrically connected in series between the pulse generator and the switch bank to sequentially open and close the switches. As discussed below, Applicant maintains that all of these features are not taught or suggested by the disclosures of Pittman, Uribe, and Iino, when considered individually or in combination with one another.

Pittman discloses a battery charger which employs a charging sequence. Col. 3, lines 53-55. Pittman fails to teach or suggest an apparatus that comprises a fuel stack, including a plurality of cells; a switch bank, including a plurality of switches, each switch electrically connected in parallel across at least one of the cells; a pulse generator capable of pulsing the cathodes of the cells when the respective switch is closed; and a control circuit electrically connected

in series between the pulse generator and the switch bank to sequentially open and close the switches. Further, as the Office acknowledges, Pittman does not teach employing multiple switches. Office Action, pages 11-12. Further, Pittman does not teach employing the method of Pittman as a fuel cell maintenance device on a fuel cell stack.

Uribe is directed to a method of operating a fuel cell at high voltage for sustained periods of time. Col. 2, lines 39-40. Uribe only discloses single fuel cells. Col. 4, line 54 and Col. 5, line 4. Uribe fails to teach or suggest an apparatus that comprises a fuel stack, including a plurality of cells; a switch bank, including a plurality of switches, each switch electrically connected in parallel across at least one of the cells; a pulse generator capable of pulsing the cathodes of the cells when the respective switch is closed; and a control circuit electrically connected in series between the pulse generator and the switch bank to sequentially open and close the switches. Uribe fails to teach or suggest using the method of Uribe for a fuel cell stack having a plurality of fuel cells. Uribe fails to teach that the method of Uribe may be used on a fuel cell stack having a plurality of fuel cells. Uribe contains no suggestion to extend the teaching of Uribe to fuel cell stacks having a plurality of fuel cells.

lino discloses a voltage detecting device for a set battery. Col. 3, lines 21-22. lino fails to teach or suggest an apparatus that comprises a fuel stack, including a plurality of cells; a switch bank, including a plurality of switches, each switch electrically connected in parallel across at least one of the cells; a pulse generator capable of pulsing the cathodes of the cells when the respective switch is closed; and a control circuit electrically connected in series between the pulse generator and the switch bank to sequentially open and close the switches. Further, lino does not teach employing the method of Pittman as a fuel cell maintenance device on a fuel cell stack.

The Office suggests that it would have been obvious to a person of ordinary skill in the art at the time of the invention to combine the teaching of Pittman and lino so that the cells in the stack will maintain an excellent state of health. Office Action, page 12. First, a mere reference to common sense is insufficient to supply the motivation or suggestion to combine Pittman and lino. *In re Lee*, 277 F.3d 1338, 61 U.S.P.Q.2d 1673, 1681 (Fed. Cir. 1988). In

addition, Applicant would point out that the Office acknowledges that neither Pittman nor Uribe teaches the use of their respective systems in a multi cell system. Office Action, page 4. Further, Uribe does not teach using the method of Uribe for a fuel cell stack having a plurality of fuel cells. In addition, the teaching of neither Pittman nor lino relate to fuel cells. Therefore, one skilled in the art would not have combined the teaching of Pittman and lino and applied them to a fuel cell stack having a plurality of fuel cells. Further, the Office provides no explanation of the suggestion or motivation to combine Pittman, lino, and Uribe. *In re Fritch*, 972 F.2d 1260, 23 U.S.P.Q.2d 1780 (Fed. Cir. 1992). "Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching suggestion or incentive supporting the combination." *In re Geiger*, 815 F.2d 686, 2 U.S.P.Q. 2d 1276, 1278 (Fed. Cir. 1987). The Office has provided no showing of the teaching or motivation to combine Pittman, Uribe, and lino.

Therefore, claim 27 is not unpatentable over Pittman in view of Uribe and in further view of lino. Reconsideration and withdrawal of the rejection of claim 27 under §103(a) is respectfully requested.

Claim 28, which depends from claim 27, also stands rejected under 35 U.S.C. § 103(a) over Pittman in view of Uribe and in further view of lino. Claim 28 further recites that each switch comprises a relay capable of shorting at least one cell of a fuel cell stack; and a dielectrically isolated driver capable of driving the relay. Claim 28 is believed to be in condition for allowance by virtue of its dependency from claim 27, discussed above. Applicant respectfully requests reconsideration and withdrawal of this rejection of claim 28.

Claim 29, which depends from claim 28, also stands rejected under 35 U.S.C. § 103(a) over Pittman in view of Uribe and in further view of lino. Claim 29 further recites that the relay comprises a solid-state relay. Claim 29 is believed to be in condition for allowance by virtue of its dependency from claim 28, discussed above. Applicant respectfully requests reconsideration and withdrawal of this rejection of claim 29.

Claim 30, which depends from claim 28, also stands rejected under 35 U.S.C. § 103(a) over Pittman in view of Uribe and in further view of lino. Claim 30 further recites that the relay is further capable of shorting a second cell of the fuel cell stack. Claim 30 is believed to be in condition for allowance by virtue of its dependency from claim 28, discussed above. Applicant respectfully requests reconsideration and withdrawal of this rejection of claim 30.

Claim 31, which depends from claim 27, also stands rejected under 35 U.S.C. § 103(a) over Pittman in view of Uribe and in further view of lino. Claim 31 further recites that each switch is capable of shorting a plurality of cells. Claim 31 is believed to be in condition for allowance by virtue of its dependency from claim 27, discussed above. Applicant respectfully requests reconsideration and withdrawal of this rejection of claim 31.

Claim 32, which depends from claim 27, also stands rejected under 35 U.S.C. § 103(a) over Pittman in view of Uribe and in further view of lino. Claim 32 further recites that at least one of the switch bank and the pulse generator is capable of receiving power returned from the fuel cell stack. Claim 32 is believed to be in condition for allowance by virtue of its dependency from claim 27, discussed above. Applicant respectfully requests reconsideration and withdrawal of this rejection of claim 32.

Claim 33, which depends from claim 32, also stands rejected under 35 U.S.C. § 103(a) over Pittman in view of Uribe and in further view of lino. Claim 33 further comprises a voltage regulator through which at least one of the switch bank and the pulse generator is capable of receiving power returned from the fuel cell stack. Claim 33 is believed to be in condition for allowance by virtue of its dependency from claim 32, discussed above. Applicant respectfully requests reconsideration and withdrawal of this rejection of claim 33.

Claim 34, which depends from claim 27, also stands rejected under 35 U.S.C. § 103(a) over Pittman in view of Uribe and in further view of lino. Claim 34 further recites that the cells are proton exchange membrane fuel cells. Claim

34 is believed to be in condition for allowance by virtue of its dependency from claim 27, discussed above. Applicant respectfully requests reconsideration and withdrawal of this rejection of claim 34.

Claim 35, which depends from claim 27, also stands rejected under 35 U.S.C. § 103(a) over Pittman in view of Uribe and in further view of lino. Claim 35 further recites that the control circuit includes a counter driven clock; and a multiplexer multiplexing the output of the pulse generator to the switches responsive to the count of the counter. Claim 35 is believed to be in condition for allowance by virtue of its dependency from claim 27, discussed above. Applicant respectfully requests reconsideration and withdrawal of this rejection of claim 35.

With respect to claim 36, and the claims which depend from claim 36, claim 36 discloses a method for transparently maintaining the cells of a fuel cell stack that comprises sequentially pulsing the cathodes of a plurality of cells in a fuel cell stack; and maintaining a consistent number of the cells providing power to a load of the fuel cell stack while sequentially pulsing the cathodes of the cells. As discussed below, Applicant maintains that all of these features are not taught or suggested by the disclosures of Pittman, Uribe, and lino, when considered individually or in combination with one another.

Pittman discloses a battery charger which employs a charging sequence. Col. 3, lines 53-55. Pittman fails to teach or suggest a method for transparently maintaining the cells of a fuel cell stack that comprises sequentially pulsing the cathodes of a plurality of cells in a fuel cell stack; and maintaining a consistent number of the cells providing power to a load of the fuel cell stack while sequentially pulsing the cathodes of the cells. As the Office acknowledges, Pittman does not teach or suggest using fuel cells. Office Action, page 14. Further, as the Office acknowledges, Pittman does not teach or suggest the maintenance of consistent power to the load. Office Action, page 14.

Uribe is directed to a method of operating a fuel cell at high voltage for sustained periods of time. Col. 2, lines 39-40. Uribe only discloses single fuel cells. Col. 4, line 54 and Col. 5, line 4. Uribe fails to teach or suggest a method for transparently maintaining the cells of a fuel cell stack that comprises

sequentially pulsing the cathodes of a plurality of cells in a fuel cell stack; and maintaining a consistent number of the cells providing power to a load of the fuel cell stack while sequentially pulsing the cathodes of the cells. Uribe fails to teach that the method of Uribe may be used on a fuel cell stack having a plurality of fuel cells. Uribe contains no suggestion to extend the teaching of Uribe to fuel cell stacks having a plurality of fuel cells.

The Office suggests that it would have been obvious to a person of ordinary skill in the art at the time of the invention to use the system of Pittman with fuel cells, as Uribe teaches it would improve the performance of the fuel cells. Office Action, page 14. Foremost, Applicant would point out that the Office acknowledges that neither Pittman nor Uribe teaches the use of their respective systems in a multi cell system. Office Action, page 4. Further, Uribe does not teach using the method of Uribe for a fuel cell stack having a plurality of fuel cells. In addition, Pittman does teach using its systems with fuel cells. Therefore, Uribe would not have motivated one skilled in the art to use the system of Pittman on a fuel cell stack having a plurality of fuel cells. Further, the Office provides no explanation of the suggestion or motivation to combine Pittman and Uribe. *In re Fritch*, 972 F.2d 1260, 23 U.S.P.Q.2d 1780 (Fed. Cir. 1992). "Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching suggestion or incentive supporting the combination." *In re Geiger*, 815 F.2d 686, 2 U.S.P.Q. 2d 1276, 1278 (Fed. Cir. 1987). The Office has provided no showing of the teaching or motivation to combine Pittman and Uribe. As a result, one skilled in the art would not have construed Uribe as teaching or suggesting using the system of Pittman on a fuel cell stack having a plurality of fuel cells.

lino discloses a voltage detecting device for a set battery. Col. 3, lines 21-22. lino fails to teach or suggest a method for transparently maintaining the cells of a fuel cell stack that comprises sequentially pulsing the cathodes of a plurality of cells in a fuel cell stack; and maintaining a consistent number of the cells providing power to a load of the fuel cell stack while sequentially pulsing the cathodes of the cells. Further, lino does not teach or suggest using fuel cells.

The Office suggests that it would have been obvious to a person of ordinary skill in the art at the time of the invention to combine the teaching of lino



and Pittman and apply them to fuel cells. Office Action, pages 14. However, neither Pittman nor lino teach using their systems with fuel cells. The Office provides no explanation of the suggestion or motivation to combine Pittman and lino. *In re Fritch*, 972 F.2d 1260, 23 U.S.P.Q.2d 1780 (Fed. Cir. 1992). "Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching suggestion or incentive supporting the combination." *In re Geiger*, 815 F.2d 686, 2 U.S.P.Q. 2d 1276, 1278 (Fed. Cir. 1987). The Office has provided no showing of the teaching or motivation to combine Pittman and lino. As a result, one skilled in the art would not have combined Pittman and lino.

Therefore, claim 36 is not unpatentable over Pittman in view of Uribe and in further view of lino. Reconsideration and withdrawal of the rejection of claim 36 under §103(a) is respectfully requested.

Claim 37, which depends from claim 36, also stands rejected under 35 U.S.C. § 103(a) over Pittman in view of Uribe and in further view of lino. Claim 37 further recites that pulsing the cathode includes generating a pulse train and sequentially supplying the pulse train to the cells. Claim 37 is believed to be in condition for allowance by virtue of its dependency from claim 36, discussed above. Applicant respectfully requests reconsideration and withdrawal of this rejection of claim 36.

Claim 38, which depends from claim 37, also stands rejected under 35 U.S.C. § 103(a) over Pittman in view of Uribe and in further view of lino. Claim 38 further recites that sequentially supplying the pulse train to the cells includes supplying the pulse train to a first cell of the fuel cell stack to pulse a cathode thereof; and switching the supply of the pulse train from the first cell to a second cell of the fuel stack to pulse a cathode thereof. Claim 38 is believed to be in condition for allowance by virtue of its dependency from claim 37, discussed above. Applicant respectfully requests reconsideration and withdrawal of this rejection of claim 38.

Claim 39, which depends from claim 36, also stands rejected under 35 U.S.C. § 103(a) over Pittman in view of Uribe and in further view of lino. Claim 39 further recites that sequentially pulsing the cathodes of the cells includes supplying the pulse train to a first cell of the fuel cell stack to pulse a cathode thereof; and switching the supply of the pulse train from the first cell to a second cell of the fuel stack to pulse a cathode thereof. Claim 39 is believed to be in condition for allowance by virtue of its dependency from claim 36, discussed above. Applicant respectfully requests reconsideration and withdrawal of this rejection of claim 39.

With respect to claim 40, and the claims which depend from claim 40, claim 40 discloses a method for transparently maintaining the cells of a fuel cell stack that comprises generating a pulse train; supplying the pulse train to a first cell of the fuel cell stack to pulse a cathode thereof; and switching the supply of the pulse train from the first cell to a second cell of the fuel stack to pulse a cathode thereof. As discussed below, Applicant maintains that all of these features are not taught or suggested by the disclosures of Pittman, Uribe, and lino, when considered individually or in combination with one another.

Pittman discloses a battery charger which employs a charging sequence. Col. 3, lines 53-55. Pittman fails to teach or suggest a method for transparently maintaining the cells of a fuel cell stack that comprises generating a pulse train; supplying the pulse train to a first cell of the fuel cell stack to pulse a cathode thereof; and switching the supply of the pulse train from the first cell to a second cell of the fuel stack to pulse a cathode thereof. As the Office acknowledges, Pittman does not teach or suggest using fuel cells. Office Action, page 14.

Uribe is directed to a method of operating a fuel cell at high voltage for sustained periods of time. Col. 2, lines 39-40. Uribe only discloses single fuel cells. Col. 4, line 54 and Col. 5, line 4. Uribe fails to teach or suggest a method for transparently maintaining the cells of a fuel cell stack that comprises generating a pulse train; supplying the pulse train to a first cell of the fuel cell stack to pulse a cathode thereof; and switching the supply of the pulse train from the first cell to a second cell of the fuel stack to pulse a cathode thereof. Uribe fails to teach that the method of Uribe may be used on a fuel cell stack having a

plurality of fuel cells. Uribe contains no suggestion to extend the teaching of Uribe to fuel cell stacks having a plurality of fuel cells.

lino discloses a voltage detecting device for a set battery. Col. 3, lines 21-22. lino fails to teach or suggest a method for transparently maintaining the cells of a fuel cell stack that comprises generating a pulse train; supplying the pulse train to a first cell of the fuel cell stack to pulse a cathode thereof; and switching the supply of the pulse train from the first cell to a second cell of the fuel stack to pulse a cathode thereof. Further, lino does not teach or suggest using fuel cells.

The Office suggests that it would have been obvious to a person of ordinary skill in the art at the time of the invention to combine the teachings of lino and Pittman with fuel cells. Office Action, page 15. Foremost, Applicant would point out that the Office acknowledges that neither Pittman nor Uribe teaches the use of their respective systems in a multi cell system. Office Action, page 4. Further, Uribe does not teach using the method of Uribe for a fuel cell stack having a plurality of fuel cells. Further, neither Pittman nor lino teach or suggest using fuel cells. In addition, the Office provides no explanation of the suggestion or motivation to combine Pittman, lino, and Uribe. *In re Fritch*, 972 F.2d 1260, 23 U.S.P.Q.2d 1780 (Fed. Cir. 1992). "Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching suggestion or incentive supporting the combination." *In re Geiger*, 815 F.2d 686, 2 U.S.P.Q. 2d 1276, 1278 (Fed. Cir. 1987). The Office has provided no showing of the teaching or motivation to combine Pittman, Uribe, and lino. Therefore, claim 40 is not unpatentable over Pittman in view of Uribe and in further view of lino. Reconsideration and withdrawal of the rejection of claim 40 under §103(a) is respectfully requested.

Claim 41, which depends from claim 40, also stands rejected under 35 U.S.C. § 103(a) over Pittman in view of Uribe and in further view of lino. Claim 41 further recites that supplying the pulse train to the first cell includes counting the pulses in the pulse train and switching the supply includes switching the supply responsive to the count. Claim 41 is believed to be in condition for allowance by virtue of its dependency from claim 40, discussed above. Applicant respectfully requests reconsideration and withdrawal of this rejection of claim 40.

Claim 42, which depends from claim 40, also stands rejected under 35 U.S.C. § 103(a) over Pittman in view of Uribe and in further view of Iino. Claim 42 further recites that supplying the pulse train to the first cell to pulse the cathode thereof includes supplying the pulse train to a first pair of cells of the fuel cell stack, the first pair including the first cell, to pulse the cathodes thereof; and switching the supply of the pulse train from the first cell to the second cell of the fuel cell stack to pulse the cathode thereof includes switching the supply of the fuel stack to pulse train from the first pair of cells to a second pair of cells, the second pair of cells including the second cell, to pulse the cathodes thereof. Claim 42 is believed to be in condition for allowance by virtue of its dependency from claim 40, discussed above. Applicant respectfully requests reconsideration and withdrawal of this rejection of claim 42.

Claim 45, which depends from claim 44, stands rejected under 35 U.S.C. §103(a) over Pittman in view of Uribe and in further view of Iino. Claim 45 further recites that the switch comprises a relay capable of shorting the cell of a fuel cell stack, and a dielectrically isolated driver capable of driving the relay. Claim 45 is believed to be in condition for allowance by virtue of its dependency from claim 44 and for those reasons that follow. As discussed below, Applicant maintains that none of the features of claim 45 are taught or suggested by the disclosures of Pittman, Uribe, and Iino, when considered individually or in combination with one another.

As acknowledged by the Office, neither Pittman nor Uribe teach using a dielectrically isolated driver. Office Action, page 4. In addition, as acknowledged by the Office, neither Pittman nor Uribe teaches the use of their respective systems in a multi cell system. Office Action, page 4. Iino discloses a voltage detecting device for a set battery. Col. 3, lines 21-22. Iino fails to teach or suggest a fuel cell maintenance device that comprises means for imposing a low impedance across at least one cell of a fuel cell stack; and a pulse generator capable of pulsing a cathode of the at least one cell of the fuel cell stack through the low impedance imposing means; wherein the low impedance imposing means includes a switch that imposes the low impedance when closed and

receiving a pulse from the pulse generator; wherein the switch comprises a relay capable of shorting the cell of a fuel cell stack and a dielectrically isolated driver capable of driving the relay. Further, lino does not teach using dielectrically isolated drivers to control the operation of a fuel cell stack.

The Office suggests that it would have been obvious to a person of ordinary skill in the art at the time of the invention to combine the teachings of lino and use dielectrically isolated drivers. Office Action, page 17. Foremost, Applicant would point out that Uribe does not teach using the method of Uribe for a fuel cell stack having a plurality of fuel cells. Therefore, Uribe would not have motivated one skilled in the art to use the system of Pittman and the dielectrically isolated driver of lino on a fuel cell stack having a plurality of fuel cells. In addition, neither Pittman nor lino teach using their systems with fuel cells. Further, the Office provides no explanation of the suggestion or motivation to combine Pittman, Uribe, and lino. *In re Fritch*, 972 F.2d 1260, 23 U.S.P.Q.2d 1780 (Fed. Cir. 1992). As a result, one skilled in the art would not have construed Uribe as teaching or suggesting using the system on Pittman and the dielectrically isolated driver of lino on a fuel cell stack having a plurality of fuel cells. Therefore, claim 45 is not unpatentable over Pittman in view of Uribe and further in view of lino. Reconsideration and withdrawal of the rejection of claim 45 under §103(a) is respectfully requested.

Claim 46, which depends from claim 45, also stands rejected under 35 U.S.C. § 103(a) over Pittman in view of Uribe and in further view of lino. Claim 46 further recites that the relay comprises a solid-state relay. Claim 46 is believed to be in condition for allowance by virtue of its dependency from claim 45, discussed above. Applicant respectfully requests reconsideration and withdrawal of this rejection of claim 46.

Claim 47, which depends from claim 45, also stands rejected under 35 U.S.C. § 103(a) over Pittman in view of Uribe and in further view of lino. Claim 47 further recites that the relay is further capable of shorting a second cell of the fuel cell stack. Claim 47 is believed to be in condition for allowance by virtue of

its dependency from claim 45, discussed above. Applicant respectfully requests reconsideration and withdrawal of this rejection of claim 47.

Claim 48, which depends from amended claim 43, stands rejected under 35 U.S.C. §103(a) over Pittman in view of Uribe and in further view of lino. Claim 48 further comprises a second means for imposing a low impedance across at least a second cell of a fuel cell stack; and a control circuit capable of controlling to which of the first and second low impedance imposing means the pulse generator output is transmitted. Claim 48 is believed to be in condition for allowance by virtue of its dependency from amended claim 43 and for those reasons that follow. As discussed below, Applicant maintains that none of the features of claim 48 are taught or suggested by the disclosures of Pittman, Uribe, and lino, when considered individually or in combination with one another.

As acknowledged by the Office, neither Pittman nor Uribe teaches the use of their respective systems in a multi cell system. Office Action, page 17. lino discloses a voltage detecting device for a set battery. Col. 3, lines 21-22. lino fails to teach or suggest a fuel cell maintenance device that comprises means for imposing a low impedance across at least one cell of a fuel cell stack; and a pulse generator capable of pulsing a cathode of the at least one cell of the fuel cell stack through the low impedance imposing means; second means for imposing a low impedance across at least a second cell of a fuel cell stack; and a control circuit capable of controlling to which of the first and second low impedance imposing means the pulse generator output is transmitted. Further, lino does not teach using a fuel cell stack.

The Office suggests that it would have been obvious to a person of ordinary skill in the art at the time of the invention to combine the teachings of lino and Pittman. Office Action, page 17. Foremost, Applicant would point out that Uribe does not teach using the method of Uribe for a fuel cell stack having a plurality of fuel cells. Further, Pittman and lino do not teach or suggest using fuel cells. In addition, the Office provides no explanation of the suggestion or motivation to combine Pittman, Uribe, and lino. *In re Fritch*, 972 F.2d 1260, 23 U.S.P.Q.2d 1780 (Fed. Cir. 1992). As a result, one skilled in the art would not have combined the teachings of Pittman, Uribe, and lino. Therefore, claim 48 is

not unpatentable over Pittman in view of Uribe and further in view of Iino. Reconsideration and withdrawal of the rejection of claim 48 under §103(a) is respectfully requested.

Claim 49, which depends from claim 48, also stands rejected under 35 U.S.C. § 103(a) over Pittman in view of Uribe and in further view of Iino. Claim 49 further recites that the second low impedance imposing means includes a second switch that imposes the low impedance when closed and receiving a pulse from the pulse generator. Claim 49 is believed to be in condition for allowance by virtue of its dependency from claim 48, discussed above. Applicant respectfully requests reconsideration and withdrawal of this rejection of claim 49.

Claim 50, which depends from claim 49, also stands rejected under 35 U.S.C. § 103(a) over Pittman in view of Uribe and in further view of Iino. Claim 50 further recites that the second switch includes a second relay capable of shorting at least a second cell of a fuel cell stack; and a second dielectrically isolated driver capable of driving a second relay responsive to the pulse generator output. Claim 50 is believed to be in condition for allowance by virtue of its dependency from claim 49, discussed above. Applicant respectfully requests reconsideration and withdrawal of this rejection of claim 50.

Claim 51, which depends from claim 50, also stands rejected under 35 U.S.C. § 103(a) over Pittman in view of Uribe and in further view of Iino. Claim 51 further recites that at least one of the first relay and the second relay is further capable of shorting one of a third cell and a fourth cell of the fuel cell stack. Claim 51 is believed to be in condition for allowance by virtue of its dependency from claim 50, discussed above. Applicant respectfully requests reconsideration and withdrawal of this rejection of claim 51.

Claim 52, which depends from amended claim 43, stands rejected under 35 U.S.C. §103(a) over Pittman in view of Uribe and in further view of Iino. Claim 52 further recites that at least one of the low impedance imposing means and the pulse generator is capable of receiving power returned from the fuel cell stack.

Claim 52 is believed to be in condition for allowance by virtue of its dependency from amended claim 43 and for those reasons that follow. As discussed below, Applicant maintains that none of the features of claim 52 are taught or suggested by the disclosures of Pittman, Uribe, and lino, when considered individually or in combination with one another.

lino discloses a voltage detecting device for a set battery. Col. 3, lines 21-22. lino fails to teach or suggest a fuel cell maintenance device that comprises means for imposing a low impedance across at least one cell of a fuel cell stack; and a pulse generator capable of pulsing a cathode of the at least one cell of the fuel cell stack through the low impedance imposing means; wherein at least one of the low impedance imposing means and the pulse generator is capable of receiving power returned from the fuel cell stack. Further, lino does not teach using a fuel cell stack.

The Office acknowledges that neither Pittman, Uribe, nor lino teach where the above elements receive returned power. The Office suggests that it would have been obvious to a person of ordinary skill in the art at the time of the invention to use the power that is being released by the battery during the pulsing for the system, and not let it be wasted. Office Action, page 19. First, a mere reference to common sense is insufficient to supply the motivation or suggestion to combine Pittman, Uribe, and lino. *In re Lee*, 277 F.3d 1338, 61 U.S.P.Q.2d 1673, 1681 (Fed. Cir. 1988). In addition, Applicant would point out that Uribe does not teach using the method of Uribe for a fuel cell stack having a plurality of fuel cells. Further, Pittman and lino do not teach or suggest using fuel cells. The Office provides no explanation of the suggestion or motivation to combine Pittman, Uribe, and lino. *In re Fritch*, 972 F.2d 1260, 23 U.S.P.Q.2d 1780 (Fed. Cir. 1992). As a result, one skilled in the art would not have combined the teachings of Pittman, Uribe, and lino. Therefore, claim 52 is not unpatentable over Pittman in view of Uribe and further in view of lino. Reconsideration and withdrawal of the rejection of claim 52 under §103(a) is respectfully requested.

Claim 53, which depends from claim 52, also stands rejected under 35 U.S.C. § 103(a) over Pittman in view of Uribe and in further view of lino. Claim 53 further comprises a voltage regulator coupled to at least one of the switch and



the pulse generator and configured to receive the power returned from the fuel cell stack. Claim 53 is believed to be in condition for allowance by virtue of its dependency from claim 52, discussed above. Applicant respectfully requests reconsideration and withdrawal of this rejection of claim 53.

Claim 54, which depends from amended claim 43, stands rejected under 35 U.S.C. §103(a) over Pittman in view of Uribe and in further view of lino. Claim 54 further recites that the pulse generator is capable of pulsing a cathode of a second cell through the low impedance imposing means. Claim 54 is believed to be in condition for allowance by virtue of its dependency from amended claim 43 and for those reasons that follow. As discussed below, Applicant maintains that none of the features of claim 54 are taught or suggested by the disclosures of Pittman, Uribe, and lino, when considered individually or in combination with one another.

lino discloses a voltage detecting device for a set battery. Col. 3, lines 21-22. lino fails to teach or suggest a fuel cell maintenance device that comprises means for imposing a low impedance across at least one cell of a fuel cell stack; and a pulse generator capable of pulsing a cathode of the at least one cell of the fuel cell stack through the low impedance imposing means; wherein the pulse generator is capable of pulsing a cathode of a second cell through the low impedance imposing means. Further, lino does not teach using a fuel cell stack.

Applicant would point out that Uribe does not teach using the method of Uribe for a fuel cell stack having a plurality of fuel cells. Further, Pittman and lino do not teach or suggest using fuel cells. The Office provides no explanation of the suggestion or motivation to combine Pittman, Uribe, and lino. *In re Fritch*, 972 F.2d 1260, 23 U.S.P.Q.2d 1780 (Fed. Cir. 1992). As a result, one skilled in the art would not have combined the teachings of Pittman, Uribe, and lino. Therefore, claim 54 is not unpatentable over Pittman in view of Uribe and further in view of lino. Reconsideration and withdrawal of the rejection of claim 54 under §103(a) is respectfully requested.

\* \* \* \* \*

All of the stated grounds of objection and rejection are believed to have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicant believes that a full and complete response has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment is respectfully requested.

Respectfully submitted,



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